REV. 17 VY EALs

Rev. 17

Approved by: NRC

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#	Category	Type	Condition	UNUSUAL EVENT (OP 3500)	ALERT (OP 3501)	SITE AREA EMERGENCY (OP 3502)	GENERAL EMERGENCY (OP 3503)
1	RADIOLOGICAL CONDITIONS	PARAMETERS	MEASURED EFFLUENTS (1)	Confirmed sample analysis for gaseous or liquid releases indicates concentrations or release rates greater than Technical Specification limits. [1 2 3 4 5 D] U-1-a	Confirmed sample analysis for gaseous or liquid releases indicates concentrations or release rates greater than 10 times Technical Specification limits. [1 2 3 4 5 D] A-1-a		
		PARAMETERS	AREA & AIRBORNE RADIATION LEVELS		Unexpected area or airborne radiation levels 1000 times normal which could require off-site impact assessment. [1 2 3 4 5 D] A-1-b		
		PARAMETERS	SITE - BOUNDARY RADIOLOGICAL DOSE			Site boundary dose resulting from an actual or imminent release of gaseous radioactivity for an actual or projected duration such that either of the following limits may be exceeded: • TEDE ≥ 100 mRem • thyroid CDE ≥ 500 mRem (2) [1 2 3 4 5 D] S-1-a	Site boundary dose resulting from an actual or imminent release of gaseous radioactivity for an actual or projected duration such that either of the following limits may be exceeded: • TEDE ≥ 1000 mRem • thyroid CDE ≥ 5000 mRem (2) (3) [1 2 3 4 5 D] G-1-a
2	FUEL DAMAGE	PARAMETERS	REACTOR WATER I-131	Rx water sample analysis exceeds 1.1 µci /gm I-131 dose equivalent for > 24 hrs. OR Rx water sample analysis reveals an instantaneous spike of 4 µci /gm I-131 dose equivalent. [1 2 3] U-2-a	Reactor coolant sample activity >300 µci /gm I-131 dose equivalent. [1 2 3] A-2-a		
		PARAMETERS	AEOG RADIATION LEVELS	Valid AEOG RAD HI-HI alarm (3-G-1) which does not clear within 30 minutes. [1 2 3] U-2-b	Confirmed sample analysis determines that the release rate is ≥ 1.5 Ci/sec. (1) [1 2 3] A-2-b		
		PARAMETERS	PRIMARY CONTAINMENT RADIATION LEVELS			Containment radiation monitors reading > 1000 R/hr. [1 2 3 4 5 D] S-2-a	
		PARAMETERS	RPV WATER LEVEL			Inability to maintain RPV water level > -48 in. [1 2 3 4 5] S-2-b	
		FUEL DAMAGE ACCIDENT	REFUEL FLOOR RADIATION LEVEL		Refuel floor or reactor building ventilation monitor high radiation trip as a result of damage to irradiated fuel. [1 2 3 4 5 D] A-2-c	Refuel floor radiation monitors reading >1000 mR/hr as a result of damage to irradiated fuel [1 2 3 4 5 D] S-2-c	
		FUEL DAMAGE ACCIDENT	FUEL POOL WATER LEVEL			Spent fuel pool water level below the top of the spent fuel assemblies. [1 2 3 4 5 D] S-2-d	
		EVENTS	LOSS OF 2 OF 3 FISSION PRODUCT BARRIERS WITH POTENTIAL LOSS OF THE THIRD				Loss of 2 of 3 fission product barriers with the potential loss of the third. (Refer to the Fission Product Barrier Matrix for assistance in making this determination.) [1 2 3] G-2-a
3	COOLANT INVENTORY	PARAMETERS	CONTAINMENT SUMP FLOW	Reactor coolant leakage into the primary containment from unidentified sources > 5 gpm OR Total reactor coolant leakage into the primary containment > 25 gpm. [1 2 3] U-3-a	Total reactor coolant leakage into the primary containment > 50 gpm. [1 2 3] A-3-a		
		PARAMETERS	DRYWELL PRESSURE		Drywell pressure ≥ 2.5 psig, AND Drywell floor drain sump hi level alarm energized, AND Drywell equipment drain sump hi level alarm energized. [1 2 3] A-3-b		
		EVENTS	PRIMARY LEAK OUTSIDE CONTAINMENT WITH FAILURE TO ISOLATE			Any 2 of the following 4 conditions: • High area temperature AND the appropriate PCIS valves fail to isolate the leak • High area radiation levels AND the appropriate PCIS valves fail to isolate the leak • High flow indications AND the appropriate PCIS valves fail to isolate the leak • Visual confirmation of a line break [1 2 3 4] S-3-a	
4	FIRE	EVENTS	ON-SITE OR IN-PLANT FIRES	Any unplanned on-site or in-plant fire not extinguished within 10 minutes. [1 2 3 4 5 D] U-4-a	Any in-plant fire which affects or will likely affect safety system equipment required either: • For continued operation in the current operating mode. • If shutdown, to achieve and maintain cold shutdown conditions. [1 2 3 4 5 D] A-4-a	Reactor pressure is >150 psig and an in-plant fire disables HPCI, RCIC and SRVs OR The plant is not in cold shutdown and an in-plant fire disables both LPCI subsystems A and B AND both Core Spray subsystems A and B OR The plant is not shutdown and an in-plant fire disables EITHER RPS OR CRD (scram function). [1 2 3] S-4-a	
5	NATURAL PHENOMENON	PARAMETERS	RIVER WATER LEVEL	River water level > 230 ft or < 209 ft. [1 2 3 4 5 D] U-5-a	River water level > 250 ft or < 200 ft. [1 2 3 4 5 D] A-5-a	River water level > 252 ft. AND Flooding which renders safe shutdown equipment inoperable. (4) [1 2 3 4 5 D] S-5-a	
		PARAMETERS	WIND VELOCITY	Sustained wind velocity > 70 mph being experienced on-site. [1 2 3 4 5 D] U-5-b	Sustained wind velocity > 75 mph being experienced on-site [1 2 3 4 5 D] A-5-b	Sustained wind velocity > 80 mph which renders safe shutdown equipment inoperable. (4) [1 2 3 4 5 D] S-5-b	
		EVENTS	EARTHQUAKE	Any earthquake sensed on-site as recognized by observation or confirmed detection. (5) [1 2 3 4 5 D] U-5-c	Earthquake exceeds the OBE or minor damage to non-nuclear safety class equipment. (6) [1 2 3 4 5 D] A-5-c	Earthquake damage to some safety class equipment. (7) [1 2 3 4 5 D] S-5-c	
		EVENTS	TORNADO	Any on-site tornado. [1 2 3 4 5 D] U-5-d	Any tornado striking a safety class structure as evidenced by physical damage. [1 2 3 4 5 D] A-5-d		
6	LOSS OF POWER	EVENTS	LOSS OF AC POWER CAPABILITY	345KV and 115KV bus voltage becomes zero OR Unplanned loss of both startup transformers OR Unplanned loss of capability of both diesel generators to supply Bus 3 or 4. [1 2 3 4 5 D] U-6-a	No off-site or on-site AC power supply is capable of energizing 4160 volt Bus 3 within 15 minutes AND No off-site or on-site AC power supply is capable of energizing 4160 volt Bus 4 within 15 minutes. [4 5 D] A-6-a	No off-site or on-site AC power supply is capable of energizing 4160 volt Bus 3 within 15 minutes AND No off-site or on-site AC power supply is capable of energizing 4160 volt Bus 4 within 15 minutes. [1 2 3] S-6-a	No off-site or on-site AC power supply is capable of energizing 4160 volt Bus 3 AND No off-site or on-site AC power supply is capable of energizing 4160 volt Bus 4 AND either: • Power restoration to at least one (Bus 3 or Bus 4) vital bus not likely within 8 hours OR • RPV water level < TAF. [1 2 3] G-6-a
		EVENTS	LOSS OF DC POWER CAPABILITY		Both 125 VDC station battery systems are de-energized. [1 2 3 4 5 D] A-6-b	Both 125 VDC station battery systems are de-energized for > 15 minutes. [1 2 3] S-6-b	
7	LOSS OF SYSTEMS OR EQUIPMENT	EVENTS	PLANT SHUTDOWN NOT COMPLETED IN ACCORDANCE WITH LCO OF TECH SPECS.	Required plant operating mode change or plant shutdown is not completed within the specified time of a Technical Specification action statement. [1 2 3 5] U-7-a			
		EVENTS	LOSS OF CR ALARMS OR INDICATORS	Unplanned loss of most or all safety system annunciation or indication (CRP 9-3, 9-4 and 9-5) in the control room for greater than 15 min. [1 2 3] U-7-b	Unplanned loss of most or all safety system annunciation or indication in the control room for greater than 15 min. AND either: • Plant transient is in progress OR • SPDS is unavailable. [1 2 3] A-7-a	Unplanned loss of most or all safety system annunciator or indication in the control room AND Plant transient is in progress AND SPDS is unavailable AND Inability to monitor one or more EOP parameters. [1 2 3] S-7-a	
		EVENTS	LOSS OF COMMUNICATION CAPABILITY	Loss of all on-site or all off-site communications capability. [1 2 3 4 5 D] U-7-c			
		EVENTS	LOSS OF DECAY HEAT REMOVAL CAPABILITY		Reactor coolant temperature cannot be maintained below 212 °F. [4 5] A-7-b	Operation in the UNSAFE region of the HCTL curve AND The main condenser is unavailable. [1 2 3] S-7-b	Reactor shutdown occurs but requisite decay heat removal systems are unavailable: • Operation in the UNSAFE region of the HCTL curve AND • Main condenser is unavailable AND • RHR System is unavailable as a heat sink for either the reactor or containment. [1 2 3] G-7-a
		EVENTS	FAILURE TO SCRAM		Automatic or manual SCRAM signal present AND It cannot be determined that the reactor will remain shutdown. (8) [1 2 3] A-7-c	Either: • Automatic and manual SCRAM signals present OR • Manual SCRAM signal present AND Reactor power remains above 2%. [1 2] S-7-c	Automatic or manual scram signal present AND Reactor power remains above 2% AND The main condenser is unavailable AND There exists uncontrolled decreasing reactor water level. [1 2] G-7-b
8	OTHER HAZARDS OR CONDITIONS	EVENTS	EXPLOSIONS	Any near or on-site explosion. [1 2 3 4 5 D] U-8-a	Any explosion which results in damage to in-plant safety systems or vital structures. [1 2 3 4 5 D] A-8-a	Any explosion which renders safe shutdown equipment inoperable. (4) [1 2 3 4 5 D] S-8-a	
		EVENTS	CRASH IMPACTS	Vehicle crash into safety related structures or systems. [1 2 3 4 5 D] U-8-b	Any crash impact which damages safety related structures or systems. [1 2 3 4 5 D] A-8-b	Any crash impact which renders safe shutdown equipment inoperable. (4) [1 2 3 4 5 D] S-8-b	
		EVENTS	MAIN TURBINE FAILURE	Turbine failure resulting in casing penetration or damage to turbine or generator seals. [1 2 3] U-8-c	Turbine casing penetration resulting in damage to safety systems or vital structures. [1 2 3] A-8-c		
		EVENTS	RELEASE OF HAZARDOUS OR TOXIC SUBSTANCES	Actual or potential release of hazardous substances which may affect personnel safety and plant operation. [1 2 3 4 5 D] U-8-d	Uncontrolled entry of toxic or flammable gas into vital areas of the plant threatening to render safety related equipment inoperable. [1 2 3 4 5 D] A-8-d	Uncontrolled entry of toxic or flammable gas into vital areas of the plant which render safe shutdown equipment inoperable. (4) [1 2 3 4 5 D] S-8-c	
		EVENTS	EVACUATION OF THE CONTROL ROOM			Evacuation of the Control Room. [1 2 3 4 5 D] S-8-d	
9	SECURITY EVENTS	EVENTS	SAFE PLANT OPERATION THREATENED	Security threat with potential to affect safe plant operation. (9) [1 2 3 4 5 D] U-9-a	On-going Security threat in progress which has the potential of affecting safe plant operation. (9) [1 2 3 4 5 D] A-9-a		
		EVENTS	LOSS OF PHYSICAL CONTROL OF THE PLANT			Determination that loss of physical control of the plant is imminent. [1 2 3 4 5 D] S-9-a	Determination that loss of physical control of the plant has occurred. [1 2 3 4 5 D] G-9-a
10	GENERAL CRITERIA			Other conditions exist which have a potential to degrade safe plant operation which warrant plant staff notification and increased awareness for off-site authorities. [1 2 3 4 5 D] U-10-a	Other events or conditions which warrant precautionary activation of the Technical Support Center and the Emergency Operations Facility. [1 2 3 4 5 D] A-10-a	Events are in progress or have occurred which warrant activation of emergency centers AND either: • Activation of off-site monitoring teams OR • Precautionary notification of the public near site has occurred or is planned. [1 2 3 4 5 D] S-10-a	Events are in progress or have occurred which warrant initiation of pre-determined protective action for the public. [1 2 3 4 5 D] G-10-a

NOTES

(1)	To be determined by sample analysis. The following may be used to indicate when analysis should be performed: Gaseous: Stack Gas Rad Mon Hi/Alert Alarms referenced by panalarms • 3-G-7: STACK GAS RAD MON SYS 1 TRBL • 3-G-8: STACK GAS RAD MON SYS 2 TRBL. Liquid: Panalarms • 3-E-7: RADWASTE EFFLUENT RAD HI • 3-F-7: DISC CANAL RAD HI • 3-F-8: SERVICE WATER EFFLUENT RAD HI. AEOG: Panalarm • 3-G-1: AEOG RAD HI - HI
(2)	Integrated dose to be determined by either: • Direct field monitoring OR • Projected off-site dose correlation.
(3)	If limits are exceeded, then protective action recommendations should be made per OP 3511.
(4)	Per VYNPS Safe Shutdown Capability Analysis Figure 2-3, Principal Safe Shutdown Systems are: • RPS (CRD SCRAM) • SRVs • Core Spray • RHR • HPCI • RCIC • RHR Service Water • Service Water
(5)	Earthquake detection criteria based on receipt of alarm from the seismic monitoring system confirmed by data analysis, multiple indications, observation, or seismic activity reports.
(6)	See OP 3127, Appendix A "Seismic Damage Indicator Walkdown Check Sheet - SDI List 1 (NNS Components)."
(7)	See OP 3127, Appendix A "Seismic Damage Indicator Walkdown Check Sheet - SDI List 2 (Safety Related Components)."
(8)	Each of the following is a means for determining that the reactor will remain shutdown: • all control rods are inserted to or beyond position 02 • all control rods are inserted to position 00 except one rod • TSC or RE has determined that sufficient control rod density exists.
(9)	Notification and response for Security Events at this level are performed in accordance with the Physical Security Plan also.

FISSION PRODUCT BARRIER MATRIX

Barrier		COOLANT ACTIVITY	RPV WATER LEVEL	DRYWELL RADIATION	DRYWELL PRESSURE	RCS LEAKAGE	PRIMARY CONTAINMENT ISOLATION	COMBUSTIBLE GAS	GENERAL
FUEL CLAD	Potential Loss		Uncontrolled decreasing RPV water level AND RPV water level < TAF						Any condition which indicates LOSS or POTENTIAL LOSS of the FUEL CLAD barrier.
FUEL CLAD	Loss	Reactor coolant sample activity > 300 uCi/gm I-131 Dose Equivalent		Containment radiation monitors reading >1000 R/hr.					
RCS	Potential Loss					Reactor coolant system leak rate >50 gpm inside the drywell OR Unisolable reactor coolant leakage outside the drywell as indicated by high reactor building area temperatures or radiation levels.			Any condition which indicates LOSS or POTENTIAL LOSS of the REACTOR COOLANT SYSTEM barrier.
RCS	Loss		RPV water level < -48 inches.	Containment radiation monitors reading > 10 R/hr	Drywell pressure > 2.5 psig AND Indication of a reactor coolant system leak inside the drywell.	Any primary coolant safety or safety relief valve fails to close.			
PRIMARY CONTAINMENT	Potential Loss			Containment radiation monitors reading > 5000 R/hr	Drywell pressure > 42 psig and increasing.			Explosive hydrogen/ oxygen mixture exists within either the drywell or torus air space. (i.e. : ≥ 6 % H2 and ≥ 5 % O2 mixtures)	Any condition which indicates LOSS or POTENTIAL LOSS of the PRIMARY CONTAINMENT barrier.
PRIMARY CONTAINMENT	Loss				Rapid uncontrolled pressure decrease following initial increase.		Intentional venting per EOPs or SAGs OR Failure of two in-series PCIS valves to isolate a release pathway OR Observed structural failure OR Unisolable reactor coolant leakage outside the drywell as indicated by high reactor building area temperatures or radiation levels.		

MODE APPLICABILITY: [1] Power Operations [2] StartUp/Hot Standby [3] Hot Shutdown [4] Cold Shutdown [5] Refuel [D] Defueled

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